

She finds no conclusive evidence for or against the view that the tropic and growth stimuli of gravity in this organ are distinct. Her work makes it evident that the lack of growth in the older nodes with the stem vertical is due both to the lack of the stimulating transverse action of gravity, and to the presence of the inhibiting longitudinal action. Thus we see these responses to stimuli becoming more and more complex. One wonders whether a study of changes, acid and otherwise, induced in the tissues of the nodes by these various exposures might not simplify the matter. Such, I believe, is the possibility of real progress in this field.—WILLIAM CROCKER.

Phylogenetic significance of endosperm.—Nuclear endosperm and cellular endosperm, and also endosperm beginning its development with a free nuclear period and later passing into a cellular condition, have been known since the days of HOFMEISTER; and since that time various modifications and peculiarities have been described, some of them characterizing genera or families or even orders; while others seem to be confined to species. Whether the character of the endosperm has any phylogenetic significance or not, is a question which has often been discussed and often answered, both in the affirmative and in the negative.

The most recent discussion¹⁵ is also the most comprehensive. It is a study of the literature rather than a laboratory investigation. For all the orders of Dicotyledons and Monocotyledons, the literature dealing with the endosperm has been assembled and discussed and charts have been made, so that it is possible to see at a glance just what the endosperm and haustorium conditions are in any order. In this bird's-eye view, the names of the principal investigators are given and full citations appear in an extensive bibliography. After describing the endosperm and haustorium situation in each order, often treating the families separately, sometimes the genera, and occasionally the species, the author adds a long summary dealing with orders. Both in the introduction and in the conclusion it is very plainly stated that the endosperm character is only one factor among many, but nevertheless endosperm and haustoria characters have great phylogenetic significance.—CHARLES J. CHAMBERLAIN.

Temperature and photo-perceptions.—In studying the influence of temperature upon phototropism in the coleoptile of *Avena sativa*, Miss DEVRIES¹⁶ has determined the influence of temperature upon the rate of photo-perception and photo-reaction and the influence of previous heating upon the rate of these processes. She finds that van't Hoff's law of rate of chemical reaction

¹⁵ JACOBSSON-STIASNY, EMMA, Versuch einer phylogenetischen Verwertung der Endosperm- und Haustorialbildung bei den Angiospermen. Sitzungsber. Kaiserl. Akad. Wiss. Wien 123:1-137. 1914.

¹⁶ DEVRIES, M. S., Der Einfluss der Temperatur auf den Phototropismus. Extrait du Rec. Trav. Bot. Néerland. 11:195-291. figs. 7. 1914.